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Obesity as an Actual Problem: Spatial Research in Kazakhstan (2011-2016)

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ABSTRACT

Background: Obesity is a growing problem. The dynamics of this disease spreading is changing in different regions, it is poorly investigated and, therefore, contradictory.

Objective: To scrutinize the spatial rates of obesity in various regions of Kazakhstan.

Methodology: The operation of preventive medicine clinics, family health centers on the study of obesity rates was investigated. Furthermore, the relationship between the growth of diabetes and obesity with population growth rates, demographic indicators in cities and rural areas was considered.

Results: Investigations demonstrated an epidemiological picture of obesity, diabetes and other pathologies related to nutrition. The activities of 4 050 medical organizations has been studied since 2011.

Conclusions: The investigation revealed a stable growth in obesity, diabetes, metabolic and nutritional disorders. The rates of diabetes and obesity according to the data of preventive medical observations in the city are higher than in rural areas. The annual increase in obesity rates during the study period amounted to 3.9%. South-Kazakhstan, Astana and Almaty were identified as the regions with the highest obesity rates.

Keywords: *Spatial research, Obesity, Diabetes, Demography, Family Health Centre*

INTRODUCTION

To decrease the morbidity in the Republic of Kazakhstan (RK), the state has strengthened financial support for preventive treatment medical organizations for the last 5 years.[1] The main function is to coordinate medical specialists of Kazakhstan in the field of diagnostics and prevention of various diseases.[2,3]

Introduction/general information: Our observations on the development of the healthcare system in Kazakhstan indicate that the coordination of efforts has not yet reached the required level.

The results of national statistics are significantly variable including international data. For example, the findings of the 5th national research in Kazakhstan indicate that 31.2% of adults suffer from obesity[4] whereas the statistics of international observers indicate: "Obesity Adult incidence rate - 23.5%".[5] However, obesity rate in interconnection with endocrinological diseases, nutrition deficiencies in respect of demographic and geographical features of the country, has not been investigated yet.

OBJECTIVES OF THE RESEARCH

To scrutinize the spatial rates of obesity in various regions of Kazakhstan. To study the dynamics of these indicators' growth for the last 5 years, in comparison with diabetes mellitus.

METHODS OF THE RESEARCH

Investigations are epidemiological, continuous (covering the entire territory of the state). They are carried out by means of mass medical examination. In addition, the studies are descriptive (descriptive-evaluative) and analytical.

The body of data included the total number of population living in the country in respect of the demographic growth. Cases of morbidity on the studied nosology and in the regions of Kazakhstan came to be in the test group. The morbidity was investigated by means of retrospective and prospective method. The analysis of the dynamics of the epidemiological process was carried out selectively with respect to obesity and diseases related to malnutrition, diabetes.

The objectives of the analysis: Statistic data has been selected in accordance with the following criteria: the diagnosed cases of obesity, diabetes, morbidity related to malnutrition in accordance with the International Classification of Diseases (ICD-10); The demographic survey in the country during the last 5 years; the morbidity rate per 100 000 population.

Statistical analysis: The processing of information was carried out with the help of "Medstat" and "Statistica 10" software. The information was taken into account from the statistic registers of all governmental and non-governmental medical outpatient hospitals and clinics, hospitals. During the statistic processing of information, quantitative and qualitative statistical features were identified.

Continuous variables are expressed as the mean ± standard deviation. The chi-square test was used to test differences in categorical variables between the cases and controls, and analysis of variance (ANOVA) or the Student's t-test was used for comparisons of continuous variables. Spearman's rank correlation and univariate regression analysis were used to determine the strength of the relationship between obesity and diabetes. A significance level of $P<0.001$ was used in this test.

Methodological approaches to achieve the aim: For the implementation of the State Healthcare Development Program (SHDP) in the primary division of Healthcare (namely, outpatient and polyclinic organizations), Family Health Centres (FHC) were established.[2,6,7,8] Their basic mission is to improve the coordinated efforts of the medical community in identifying and preventing risk factors of diseases.

In section №3 of the SHDP, it was deduced that the man's health 50% depends on his or her lifestyle. This provision is recommended to be taken into account by medical staff while dealing with the population of the country promoting sanitary knowledge. The above mentioned principles were pursued in our investigation very consistently and precisely.

RESULTS

According to the research, in respect of the state statistics in 2016, 4 050 medical organizations were registered in Kazakhstan including outpatient – polyclinics – 3 149 and hospitals - 901.

Based on the results of the first year of Program realization, we have selectively conducted an experienced pilot analysis of medical staff activity in medical organizations in Astana and the surrounding suburbs. By means of questioning, the opinion of 1 000 patients and 125 doctors was inquired in the HFC. The research group was interested in a mutual opinion (patients and doctors) on the motivating aspects of their intercommunion, on the principles of medical staff activities and prospects of its realization. It was clarified that the medical staff of HFC preventive branches defined the main challenges of their initial stage activities. They pursue the following principles: determiners of diseases related to the lifestyle depend on the social environment. However, mostly they depend on the behavior of a person and, hence, can be changed and the risk of morbidity development will be significantly reduced.

Based on the questionnaire results, the majority of patients (85%) turned out to have common interests with doctors' principles. Besides this, in 77.2% of cases they supported participate in preventive activities, and even involve other interested patients. The rest of patients were skeptical in success of medical staff intercommunion with patients in the framework of the prevention program.

93.1% of medical staff is sure in close intercommunion and only 6.9% doubted in its effectiveness, particularly, in patients' discipline, for instance, refusal to harmful habits, behavior changing, etc. However, the main result of the pilot analysis reported the support and successful realization principles of HFC preventive measures.[7]

Three basic methods were used to investigate the general morbidity:

- Data on patient treatment (actual morbidity or primary morbidity, spread of diseases, sickness or general morbidity);

- Data on medical examinations (pathologic lesion);
- Data on causes of death.

In some cases, the fourth additional method (survey of population, questioning) was used. The primary treatment of the patient in a medical institution and a morbidity identified by home sick call was considered as the observation element in measuring the total morbidity in each year. To calculate the total incidence rate (TM), the following formula was used: TM=the total number of registered diseases in the reporting year×100 000/average annual population.

During the investigation, the demographic survey (total population) of the country was analyzed. Besides this, the dynamics of demographic growth in Kazakhstan and its relationship with the population health rates was determined. It was revealed that the number of population by January 1, 2011 amounted to 16 442 000 whereas this rate increased to 16 675 400 by January 1, 2012.[9]

However, at the end of 2016, the population reached over 17 754.1. Urban population (54.1%) prevails over rural (45.9%).[10,11,12] In addition, the population increase over 5 years of the research turned out to be over 1.2 million people or 7.47%. The annual growth rate, on average, amounted to 1.5%.

The total morbidity (in absolute numbers) for all classes of diseases listed in "ICD-10" over the five-year period increased only by 1%. However, a morbidity related to endocrinological disorders, malnutrition and metabolic disorders (E00-E89) increased significantly by 19.7%. If this rate is compared with the population growth, it turns out that it exceeds it by almost 2.6 times (7.47% to 19.7%). Moreover, with further analysis of the statistical results (in terms of 100 000 people), it turned out that the endocrine morbidity with malnutrition and metabolic disorders increased by 13% namely from 3 745.1 to 4 232.7.

The data analysis received from various regions of Kazakhstan illustrated that the morbidity of diabetes (the number of diseases registered for the first time, per 100 000 people) is gradually increasing. In addition, the same is noted with obesity. (Table 1.)

Table 1. Morbidity of diabetes and obesity in Kazakhstan (the number of diseases registered for the first time per 100 000 people in 2011 and 2016)

Category of population	Total morbidity*		Diabetes*		Overweight and obesity*	
	2011	2016	2011	2016	2011	2016
Rural	**575.4** (11.2)	**575.8** (10.0)	**116.1** (8.1)	**138.4** (7.2)	**115.9** (7.4)	**140.3** (5.3)
(% from total morbidity)	*(100%)*	*(100%)*	*(20.2%)*	*(23.5%)*	*(20.1%)*	*(24.4%)*
Urban	**1269.5** (23.1)	**1104.8** (17.1)	**193.5** (5,2)	**198.7** (3.2)	**197.4** (2.4)	**203.1** (2.6)
(% from total morbidity)	*(100%)*	*(100%)*	*(15.2%)*	*(18.0%)*	*(15.5%)*	*(18.4%)*

Note to Table 1:

* - number of diseases SD, registered for the first time, per 100 000 people of the population with a confidential interval of 95% and a statistical significance level, $p \leq 0.05$

It was revealed that the number of patients with diabetes mellitus, registered five years after the start of the investigation, significantly and authentically increased: in rural areas by 19.2%, in cities by 2.7%. Moreover, the investigation demonstrated the similar growth with obesity. In addition, the dynamics of obesity growth in cities was significantly higher than in rural areas. Conversely, the specific gravity of diabetes and obesity in relation to the total morbidity (in percentage) among urban population turned out to be lower than that of rural areas.

According to the official data (published in the statistical volume on health in 2015), the average morbidity of diabetes in Kazakhstan was 168.6 (per 100 000 people). However, the morbidity of obesity in relation of overweight people was 171.7 (per 100 000). These incidence rates of diabetes and obesity in the regions of Kazakhstan were calculated and presented by the regional boards. According to the results of our additional analysis in relation of 2016, the incidence rates turned out to be somewhat higher. For instance, the incidence rate of diabetes in early 2016 was 180.7 (per 100 000 people). But the morbidity of obesity, without consideration of overweight patients, rose to the level of 91.2 (per 100 000 people). (Table 2.)

Table 2. Incidence rate of obesity and diabetes in the regions of Kazakhstan from 2011 to 2016

№	Regions of Kazakhstan, cities	Obesity*			Diabetes*		
		2011	2016	R., %	2011	2016	R., %
1	Akmola	56.1	69.6	4.8	183.0	203.8	2.3
		(0.01)	(0,01)		(0.01)	(0.01)	
2	Aktobe	71.2	75.3	1.2	107.1	127.4	3.8
		(0.01)	(0.01)		(0.01)	(0.01)	
3	Almaty	46.3	53.9	3.3	192.5	207.0	1.5
		(0.01)	(0.01)		(0.01)	(0.01)	
4	Atyrau	63.0	82.1	6.1	138.5	144.7	0.9
		(0.01)	(0.01)		(0.01)	(0.01)	
5	East-Kazakhstan	63.5	101.2	11.9	192.7	132.2	-6.3
		(0.02)	(0.01)		(0.02)	(0.01)	
6	Zhambyl	32.9	56.3	14.2	140.6	177.9	5.3
		(0.01)	(0.01)		(0.01)	(0.01)	
7	West-Kazakhstan	56.3	75.6	6.9	112.2	171.9	10.7
		(0.01)	(0.01)		(0.01)	(0.01)	
8	Karaganda	61.2	63.4	0.7	190.3	244.0	5.6
		(0.01)	(0.01)		(0.01)	(0.02)	
9	Kostanay	70.2	82.3	3.4	175.7	140.1	-4.1
		(0.01)	(0.01)		(0.01)	(0.01)	
10	Kyzylorda	62.1	66.9	1.5	100.7	190.8	17.9
		(0.01)	(0.01)		(0.01)	(0.01)	
11	Mangystau	129.1	109.9	-3.0	118.3	134.3	2.7
		(0.01)	(0.01)		(0.01)	(0.01)	
12	Pavlodar	132.8	108.5	-3.7	162,2	174,7	1.5
		(0.01)	(0.01)		(0.01)	(0.01)	
13	North-Kazakhstan	85.3	102.1	3.9	266.8	271.6	0.4
		(0.01)	(0.01)		(0.01)	(0.01)	
14	South-Kazakhstan	96.7	145.8	10.2	133.7	213.1	11.9
		(0.01)	(0.01)		(0.01)	(0.01)	
15	Almaty city	119.8	122.8	0.5	174.9	182.1	0.8
		(0.01)	(0.01)		(0.01)	(0.01)	
16	Astana city	136.4	143.2	1.0	153.6	176.1	2.9
		(0.01)	(0.01)		(0.01)	(0.01)	

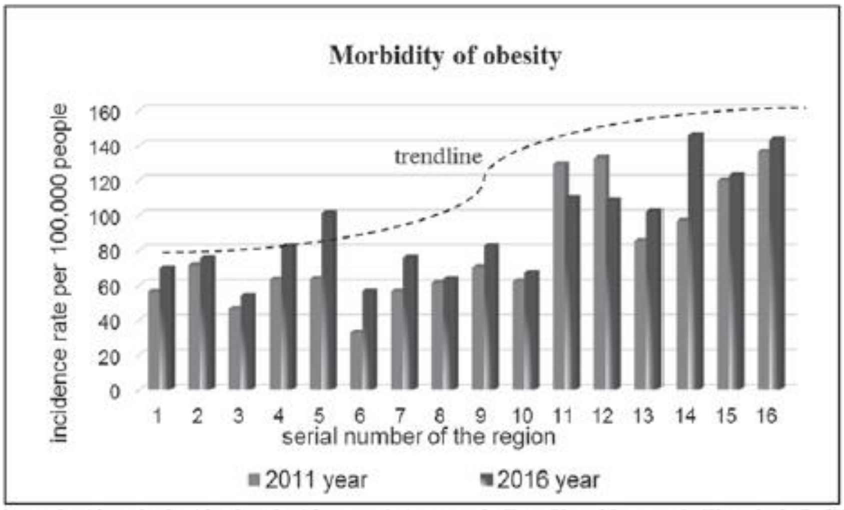
Note to Table 2:

* - number of diseases SD, registered for the first time, per 100 000 people of the population with a confidential interval of 95% and a statistical significance level, $p \leq 0.05$;

R., % - the annual increase in obesity; (….) - SD.

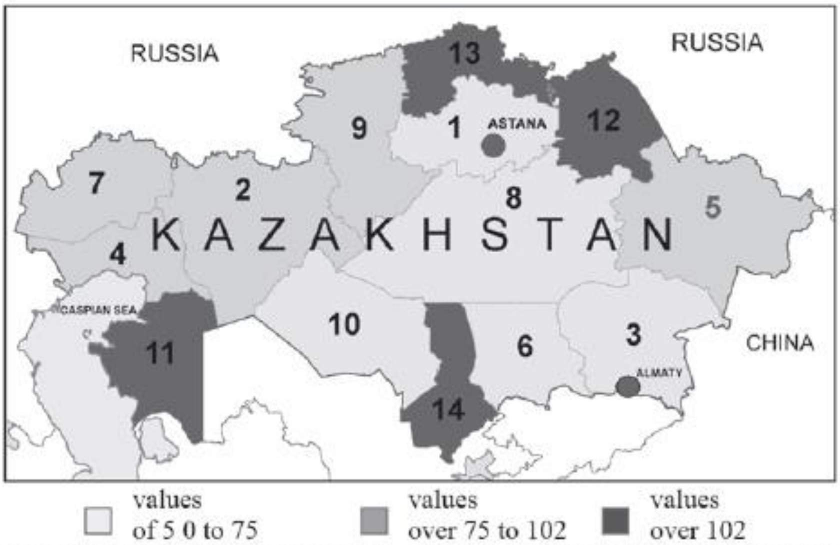
The results are indicated for comparison at the beginning and at the end of the investigation. Besides this, the rate increase of morbidity in percentage in each region during the observation period was determined (R., %).

The results of the analysis are visually represented in color mapping (Fig. 1, Fig. 2).



Regions: 1. Akmola 2. Aktobe, 3. Almaty, 4 Atyrau, 5. East-Kazakhstan, 6. Zhambyl, 7. West-Kazakhstan, 8. Karaganda, 9. Kostanay, 10. Kyzylorda, 11. Mangystau, 12. Pavlodar, 13. North-Kazakhstan, 14. South-Kazakhstan, 15. Almaty city, 16. Astana city.

Fig. 1: Morbidity of obesity in different regions of the Kazakhstan (2011-2016)



Regions: 1. Akmola 2. Aktobe, 3. Almaty, 4 Atyrau, 5. East Kazakhstan, 6. Zhambyl, 7. West Kazakhstan, 8. Karaganda, 9. Kostanay, 10. Kyzylorda, 11. Mangystau, 12. Pavlodar, 13. North Kazakhstan, 14. South Kazakhstan, 15. Almaty city, 16. Astana city.

Fig. 2: Regions with a high incidence of obesity (2016 year)

DISCUSSION

The results of a five-year investigation, such as the incidence rate distinction in rural and urban areas, uneven correlation of diabetes rate with the obesity growth, the different rates of obesity growth in Kazakhstani regions can be estimated as somewhat paradoxical. However, to explain it, it is necessary to take into consideration the following peculiarities of state's development.

Firstly, the specific gravity of identified patients in rural areas is increasing as a result of the extensive and intensive activities of HFC medical staff. Moreover, it is because of the active identification of overweight people and their inclusion in statistical reports (where many patients were not registered).

Secondly, this process occurs because of intensive migration of the population from rural areas to large cities and it increases the total number of people (including healthy and sick people) in absolute numbers.[13,14]

Furthermore, the treatment rate of patients to medical organizations in the cities is traditionally higher, which also affects the statistical data. Population involvement in preventive activities, prevention of morbidity development, the enhancement of healthy lifestyle increased the treatment of obesity patients to doctors in regions and changed our analyzed medical reports. The results of studying correlation Pearson depicted that obesity rates are closely related to diabetes mellitus. The highest correlation (r) was in 2011 (0.97). In 2016, it decreased slightly (0.96). Moreover, comparing the level of obesity correlation in regions and observation years, the rate (r) turned out to be 0.83. Calculation and comparison of the obesity rate (r) showed an unexpected result with the growth of diabetes as for the years from 2011 to 2016 and regions. This correlation was less expected at the level of (0.58).

The regions with the highest incidence of obesity by the end of 2016 were South-Kazakhstan (146.2), Astana (144.0) and Almaty (123.8). Kostanay and Atyrau regions were registered in average (82-83.0). At the lowest levels were Almaty (54.3), Zhambyl (57.1) and Karaganda (64.2).

Comparing the results obtained in a similar investigation, it can be noted that the situation of some regions at that time were somewhat different on the territory of Kazakhstan (from 2004 to 2008). [15]

Regions with high rates in 2008 (from 94.9 and higher) - Almaty (118.5), Astana (135.5), Mangystau (139.7) and Pavlodar (143.0). With average rate (from 57.9 to 94.9) - Kyzylorda (59.0), Karaganda (60.6), Kostanai (67.4), Aktobe (69.3) East Kazakhstan (74.0) and North-Kazakhstan (80.6). Regions with low rate (up to 57.9) are Zhambyl (28.4), West Kazakhstan (41.2), Almaty (45.8), Atyrau (50.6), Akmola (52.0) And South Kazakhstan (56.9).

Alongside, other statistical results should be indicated. According to the research of G.A. Musina and co-authors from the Republican Center for Development of Healthcare, rates are noticeably different.[16] Should Almaty, Pavlodar and Astana are referred to cities with a high extensive rate of obesity - 13.7%, the lowest extensive obesity rates, according to the data of the authors, are registered in Atyrau (2,2%). Moreover, researchers note that the main part of examinees are not aware of their exact weight and level of fatness. In their conclusions, the authors of the report urge the medical organizations of Kazakhstan: to strengthen preventive measures among the population; to organize activities explaining the harm of this disease for health; to instruct with regular nutrition and form a healthy lifestyle.

CONCLUSIONS

The rates of diabetes and obesity according to the data of preventive medical observations in the city are higher than in rural areas. It can be accounted for intensive internal migration of the population from rural areas to large cities. The annual increase in obesity rates during the study period amounted to 3.9%. The highest correlation (Pearson) of obesity value and diabetes is (r, 0.96). However, the correlation with the growth of diabetes from 2011 to 2016, as well as in respect to specific regions was not expressed (in some cases, it decreased to 0.58). South-Kazakhstan, Astana and Almaty were identified as the regions with the highest obesity rates. The reasons for such obesity rating in Kazakhstan should be clarified.

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Ethical considerations: The proceeding paper for investigation related to obesity problems was approved by the Ethics Research Committee of the Medical University (№1, Jan. 25, 2014 and №3, Dec. 24, 2015).

The permission for receiving statistical information from the regional Health Departments of the Republic of Kazakhstan was not required. The reason is that data on demographic changes in the country, the population treatment to medical institutions, morbidity classification are published in free access. This data does not point out patient's personal information in accordance with inviolability of private life (Article 142 of the Criminal Code of the Republic of Kazakhstan, dated 9.11.2011, No. 490-IV).

Conflict of Interest: No

REFERENCES

1. Postanovlenie Pravitel'stva Respubliki Kazahstan ot 21 dekabrya 2007 goda № 1260 /Ob utverzhdenii programmy «Zdorovyj obraz zhizni» na 2008 - 2016 gody. Astana: 2007. http://online.zakon.kz/m/Document/?doc_id=30151178#sub_id=100 Accessed May 01, 2010.
2. Kodeks Respubliki Kazahstan (№ 193-IV ot 18 sentyabrya 2009 goda «O zdorov'e naroda i sisteme zdravoohraneniya». Astana: 2009. http://www.mz.gov.kz/ru/node/322556 Accessed April 23, 2017.
3. Zdorov'e naseleniya Respubliki Kazahstan i deyatel'nost' organizacij zdravoohraneniya v 2015 godu. Statisticheskij sbornik. Astana: 2016: 358.
4. Gosudarstvennaya programma razvitiya zdravoohraneniya Respubliki Kazahstan «Densaulyк» na 2016-2019 gody. Astana: 2016: 4. http://www.enbek.gov.kz/ ru/node/332663 Accessed January 01, 2017.
5. «CIA World Factbook» https://www.cia.gov/library/PUBLICATIONS/the-world-factbook/geos/kz.html Accessed April 23, 2017.
6. Gosudarstvennaya programma razvitiya zdravoohraneniya Respubliki Kazahstan «Salamatty Қazaқstan» na 2011-2015 gody (utverzhdena Ukazom Prezidenta Respubliki Kazahstan ot 29 noyabrya 2010 goda № 1113) http://adilet.zan.kz/rus/docs/U1000001113 Accessed April 23, 2017.
7. O sovershenstvovanii profilakticheskih uslug v organizaciyah zdravoohraneniya, okazyvayushchih pervichnuyu mediko-sanitarnuyu pomoshch' Prikaz i.o. Ministra zdravoohraneniya Respubliki Kazahstan ot 17 fevralya 2012 goda № 89. IS Paragraf- http://online.zakon.kz/document/?doc_id=31144104 Accessed December 21, 2016.
8. Ukaz Prezidenta Respubliki Kazahstan ot 2 iyulya 2014 goda № 851 «O vnesenii izmenenij i dopolnenij» http://online.zakon.kz/Document/?doc_id=31574933 Accessed December 11, 2016.
9. Zdorov'e naseleniya Respubliki Kazahstan i deyatel'nost' organizacij zdravoohraneniya v 2011 godu. Statisticheskij sbornik. Astana: 2012: 320.
10. Komitet po statistike Ministerstva nacional'noj ehkonomiki Respubliki Kazahstan: oficial'naya statisticheskaya informaciya. Sborniki, kvartal'nye izdaniya, ehlektronnye tablicy, analitika. Zdravoohranenie, arhiv; 2012. http://www.stat.gov.kz/ faces/wcnav_externalId/home Numbers HealthCare Accessed November 27, 2016).
11. Komitet po statistike Ministerstva nacional'noj ehkonomiki Respubliki Kazahstan: oficial'naya statisticheskaya informaciya. Sborniki, kvartal'nye izdaniya, ehlektronnye tablicy, analitika. Zdravoohranenie, arhiv; 2015. http://www.stat.gov.kz/ faces/wcnav_externalId/home Numbers HealthCare Accessed December 01, 2016).
12. Komitet po statistike Ministerstva nacional'noj ehkonomiki Respubliki Kazahstan: oficial'naya statisticheskaya informaciya. Sborniki, kvartal'nye izdaniya, ehlektronnye tablicy, analitika. Zdravoohranenie, arhiv; 2016. http://www.stat.gov.kz/ faces/wcnav_externalId/home Numbers HealthCare Accessed December 23, 2016).
13. Demograficheskij ezhegodnik Kazahstana. Statisticheskij sbornik. Astana: 2011: 592.
14. Arhiv novostej: 31.10. 2016. Nacional'nyj centr problem formirovaniya zdorovogo obraza zhizni Ministerstva zdravoohraneniya i social'nogo razvitiya Respubliki Kazahstan www.hls.kz/news_1_322 Accessed December 15, 2016).
15. Igisinov N. S., Baltakaeva A. M. Prostranstvennaya ocenka zabolevaemosti ozhireniem v Kazahstane. Molodoj uchyonyj 2011; 2; 2: 153-156.
16. Musina G.A., Azanova B.A., Temerbekov F.O., Mergentaj A. Mediko-social'nye aspekty problem lishnego vesa. Nauka i zdravoohranenie 2011; 5: 105-108.

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